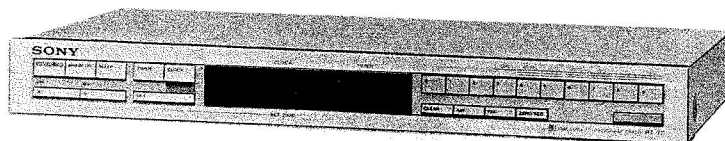


PT-77

*US Model
Canadian Model*




PROGRAM TIMER


SPECIFICATIONS

Power requirements	120 V ac, 60 Hz
Power consumption	10 watts
Time display	12-hour or 24-hour system selectable
Clock	Quartz-locked
Time accuracy	±15 seconds/month
Timer setting	Up to eight on/off programs on any day of the week accuracy measured in minutes
Power backup duration	10 minutes (when the batteries have been charged at least 72 hours)
Ac outlets	two (A and B), up to 600 watts for each outlet
Dimensions	Approx. 430 × 55 × 265 mm (w/h/d) (17 × 2¼ × 10½ inches)
Weight	Approx. 2.9 kg (6 lb 6 oz)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

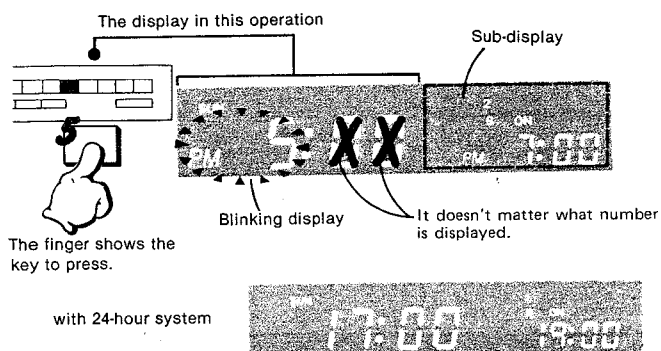
LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES ÉCLATÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.



SONY®

SERVICE MANUAL

MEANINGS OF THE ILLUSTRATIONS IN THIS MANUAL




TO GUIDE YOU WHILE SETTING THE CLOCK AND TIMER

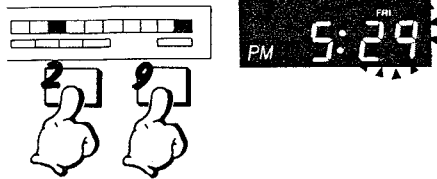
After connecting the power cord to the wall outlet and pressing the CLOCK and the SET keys at the same time, or after pressing the SET key after pressing the TIMER key, part of the display in the display window blinks to indicate what has to be set next.

SETTING THE CLOCK

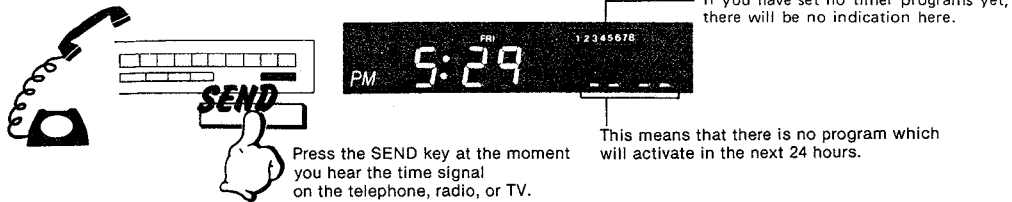
For example, to set the clock to Friday, 5:29 PM (by the 12-hour system)

- 1 Connect the power cord of the timer to a wall outlet. 
- 2

5 Set the minute.



6 Start the operation of clock from zero second.



If you make a mistake while setting the clock...

If you find a mistake between Step 1 and 5, press the SET key until the display you want to correct blinks. After correcting the data, press the SEND key as many times as you pressed the SET key.

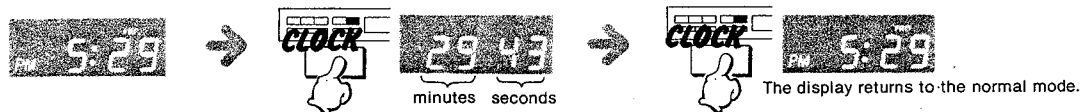
Example: If you mistook PM for AM...



TO DISPLAY THE TIME IN SECONDS

Press the CLOCK key. The correct time will be displayed in minutes and seconds on the present time display.

Example:



SETTING THE TIMER

This timer can be set to control up to eight on/off operations of the audio equipment connected to ac outlet A or B. Each timer program can be set to operate on any day of the week. They need not be all set at one time, nor set in order.

The built-in microcomputer arranges the programs from the earliest turn-on program to the latest turn-on program in order and gives each program a number.

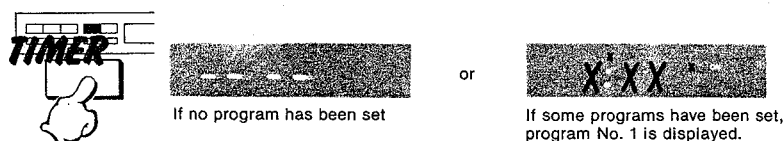
THE TIMER PROGRAM

Always set turn-on times and turn-off times in pairs.

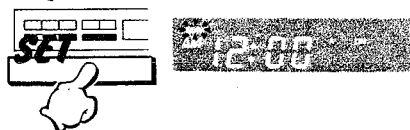
Example: To turn on the equipment connected to AC OUTLET B on Saturday at 11:15 PM and turn it off on Sunday at 1:45 AM.

Follow the numbered sequence. (The illustration shows setting by the 12-hour system)

1

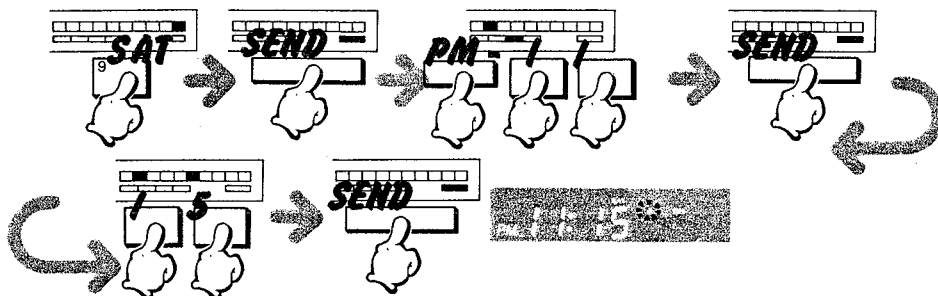


2



3

Set the turn-on day and time in the same way as you set the clock. In this example, let's set Saturday, 11:15 PM as the turn-on time.

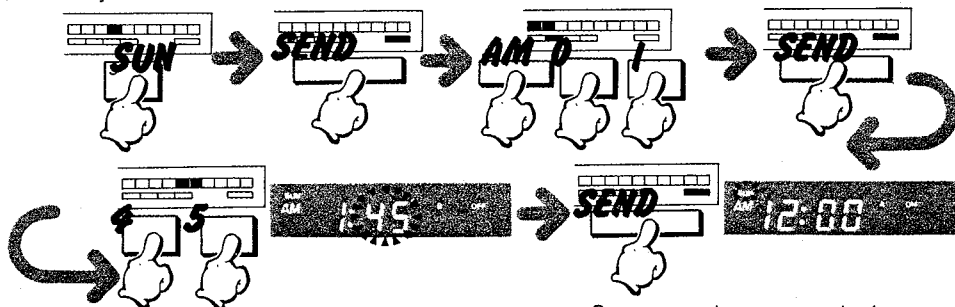


4 Press the A or B key, depending on which ac outlet the component you want to turn on and off by the timer is connected to.



5

Set the turn-off day and time.

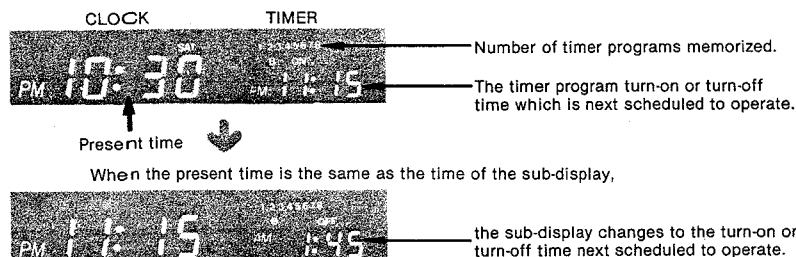


One program is now memorized, and the timer is prepared for the next program.

You can set up to 8 programs in the same way.
If you press the SEND key after setting 8 programs,
the letters "FULL" will be displayed in the display window.

FULL

To return the display to the present time/day display, press the CLOCK key.



- If you do not press the SEND key and let the indicators blink for four minutes, the display will automatically return to the present time/day display.

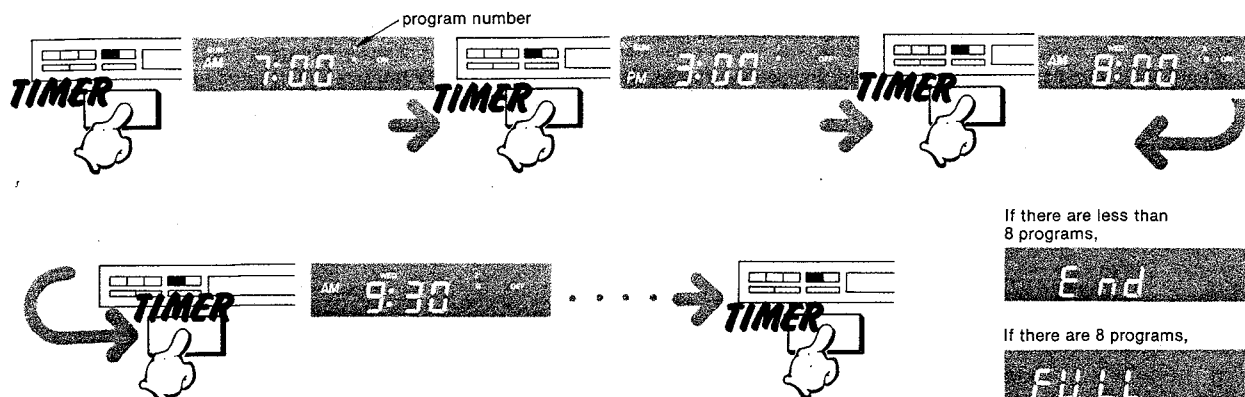
HOW TO SET THE TIMER TO OPERATE ON MORE THAN ONE DAY IN A WEEK

If you want the timer to operate a particular program on more than one day in a week, instead of pressing a turn-on day in Step 3 on the previous page, press the appropriate number/day set key as follows:

1. To operate the program every day of the week:
Press **0** and then SEND key.
2. To operate the program MON, TUE, WED, THU, FRI and SAT:
Press **1** and then SEND key.
3. To operate the program on any 6 days in a week:
Press **0** and the number/day set key of the day you **do not** want the program to operate, then SEND key.
4. To operate the program MON, TUE, WED, THU and FRI:
Press **2** and then SEND key.

TO CHECK TIMER SETTING

Press the TIMER key. The turn-on and turn-off times of the first program will be displayed.
When you press the TIMER key again, the turn-on and turn-off times of the next program will be displayed.



To check the timer settings on a particular day of the week

Press the appropriate number/day key after pressing the TIMER key.

Each time you press the number/day key,

the turn-on and turn-off times of the next program scheduled for operation on that day will be displayed.

If there is no program on that day, "End" will be displayed.

If you press another number/day key, the programs on that day will be displayed.

To reset to the normal check mode, press the CLOCK key, then press the TIMER key again.

TO RESET A TIMER SETTING

Press the **TIMER** key until the program you want to reset is displayed, then press the **CLEAR** key.

The day indicator will begin to blink.

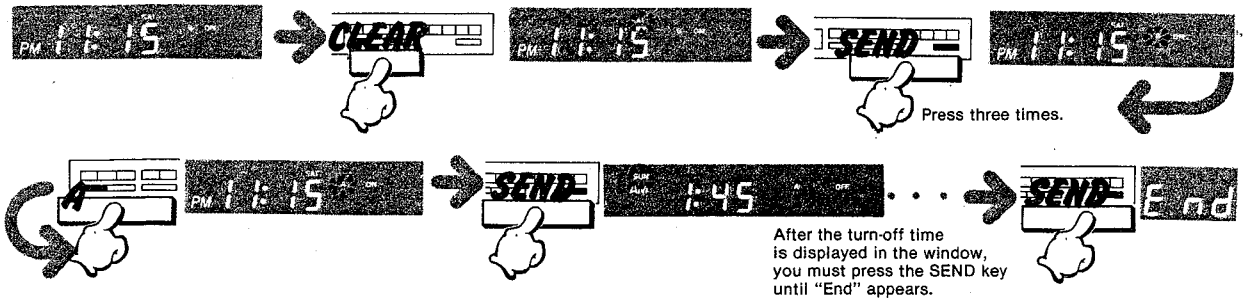
If the day setting does not have to be changed, press the **SEND** key.

Press the **SEND** key as many times as necessary for the indication that needs to be reset to begin to blink.

Reset the setting and press the **SEND** key until "End" or "FULL" appears in the display window.

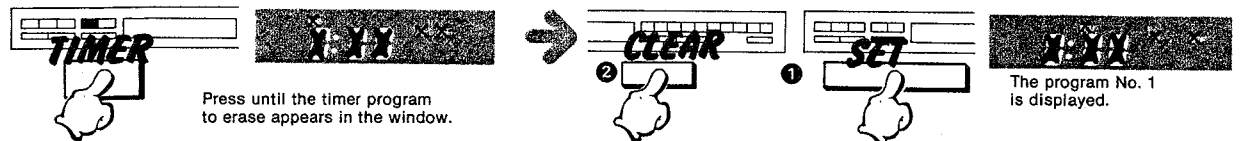
Do not forget to press the SEND key after displaying the turn-off time.

Example: To change the timer control ac outlet from B to A.



TO ERASE A TIMER SETTING

To erase a timer program, press the **CLEAR** key and the **SET** key.

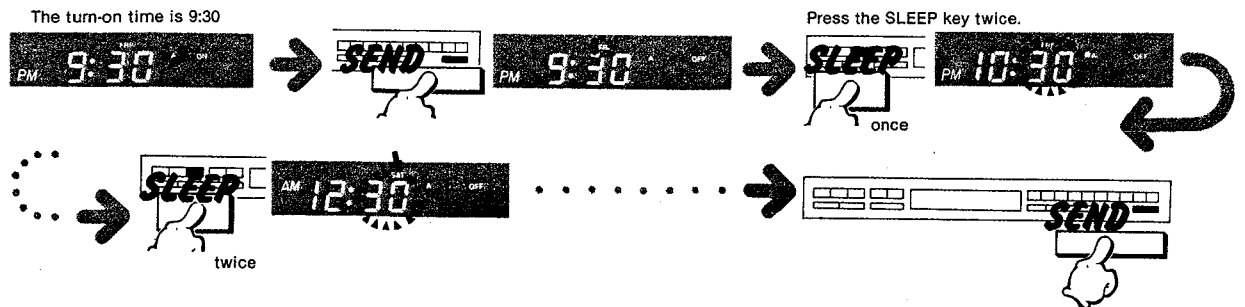


Press the **CLOCK** key and check the program number displayed by the sub-display. The number should now be one less than before.

EASIER TURN-OFF TIME SETTING

If it is exactly an hour or its multiple from the turn-on time to the turn-off time, you can set the turn-off time easily by pressing the **SLEEP** key.

Example: If the turn-on time is set at 9:30 PM, and you want to set the turn-off time at 11:30 PM,...

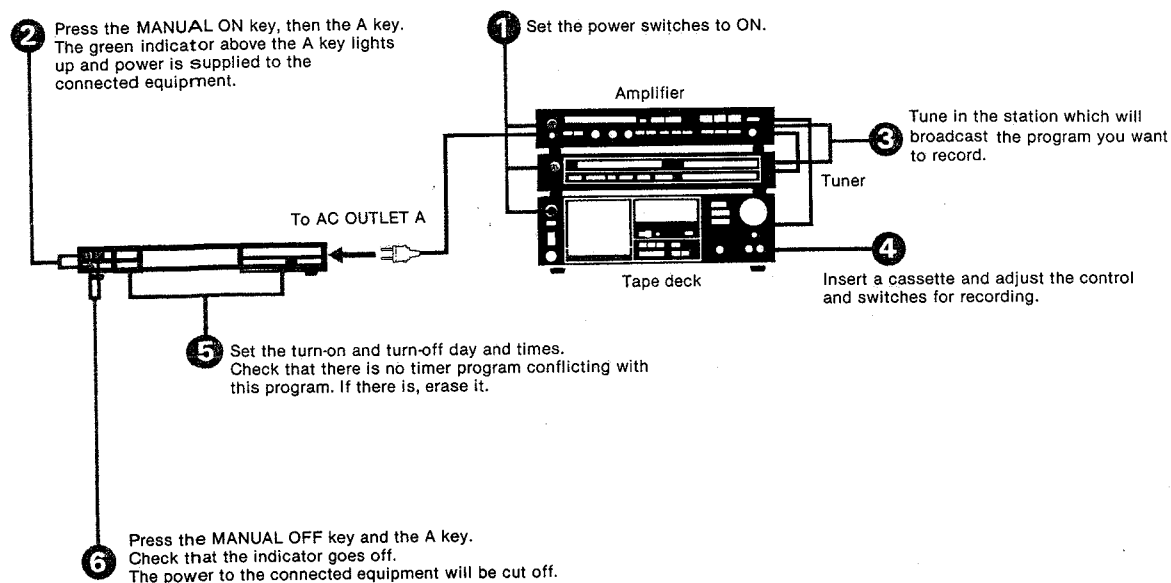


EXAMPLES OF TIMER USE

TIMER-ACTIVATED RECORDING AND PLAYBACK

Use a tape recorder with a timer-standby function.
Read the instruction manual of the tape recorder, too.

Example: To record with the audio components connected to ac outlet A of the timer.



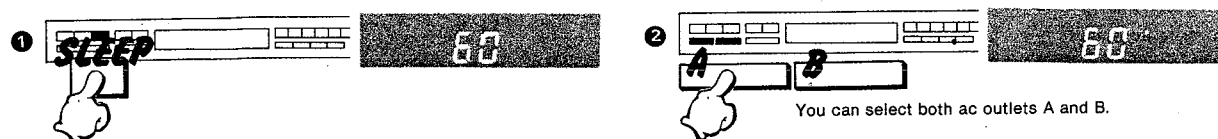
- You can perform timer activated playback in the same way.

Note

If the timer-standby function of your tape recorder allows for only one timer-activated operation and it does not turn the recorder off automatically when the timer cuts off the power, it is important to set the turn-off time of the timer so that the power to the tape recorder will be cut off after the automatic shut-off mechanism has disengaged the recorder's operating mode. Avoid setting the timer so that it will shut off power to the tape recorder while it is operating.

SLEEP TIMER—To turn off the power an hour later

Independent of the timer programs, you can set the timer to automatically turn off connected equipment an hour later. You will find this function useful if you like to listen to music while falling asleep.



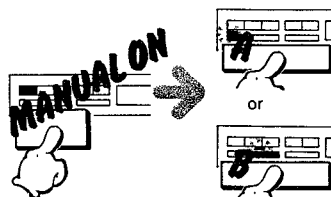
The time display (60) counts down every minute, and 4 minutes later (when display is 56), the display returns to the present day/time display automatically.

- If, at the turn-off time set by the SLEEP key, the outlet is scheduled to be turned on by a timer program, the turn-on setting of the timer program has priority and the sleep timer will not function.

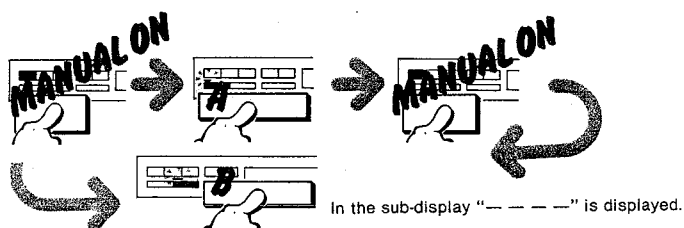
MANUAL ON/OFF SETTING

Manual ON

To turn the power of the connected equipment on, regardless of the timer program, proceed as follows.



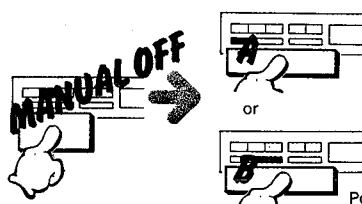
To supply power to both ac outlets A and B, press the MANUAL ON key again, then press the A or B key.



The turn-off setting of the timer program does not disengage the manual ON setting. To disengage the manual ON setting, proceed the manual OFF setting.

Manual OFF

To turn the power of the connected equipment off immediately, proceed as follows.

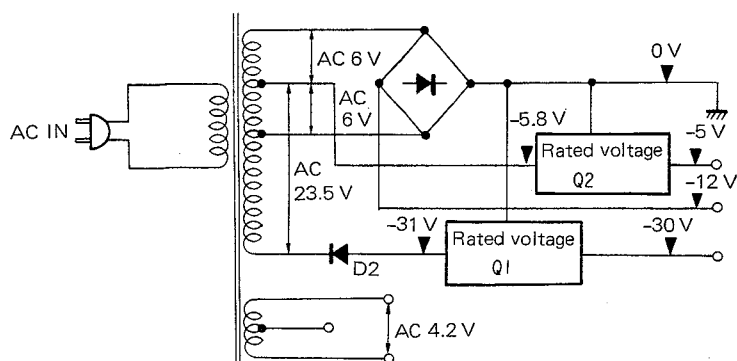


Power is cut off to the ac outlet A or B, depending on which key you have pressed.

The manual ON setting and the sleep timer are disengaged.

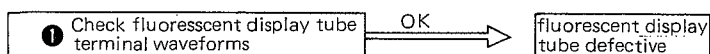
Troubleshooting

1. Power Supply Voltage Check

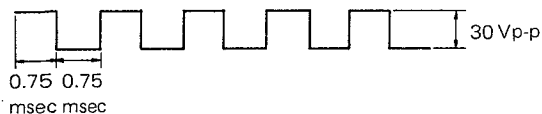


Note: The following checks should be performed only after checking power supply voltage.

2. Fluorescent display tube doesn't light up at all.



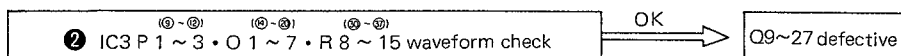
Q9-11•15•18•20•22 collector



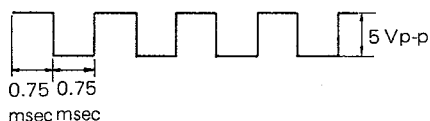
Q12-14•16•17•19•21•23-27 collector



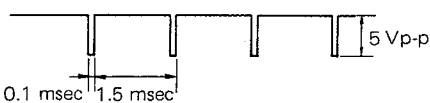
NG



O1~7
(14~20)



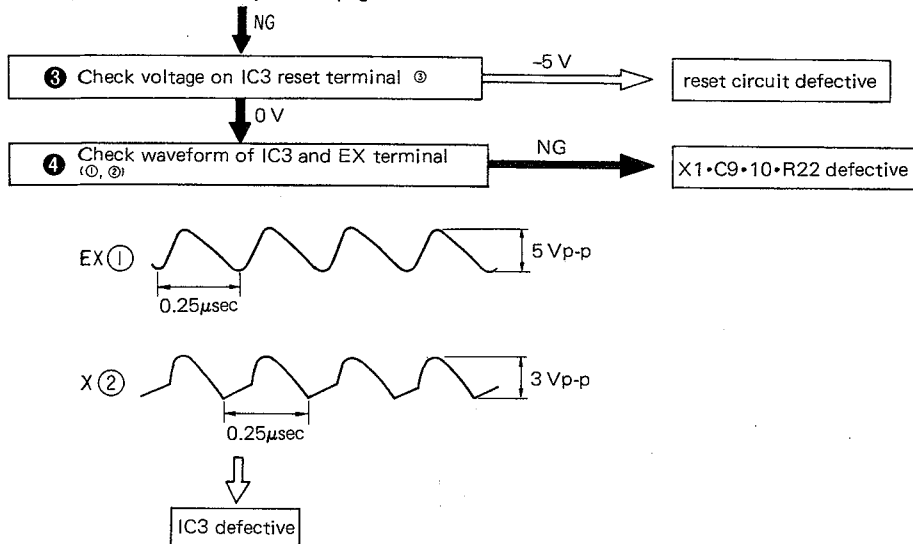
P0~3
(9~12)
R8~15
(30~37)



NG

— continued on next page —

Continued from previous page.



3. Part of fluorescent display tube doesn't light up. (See waveform for not lighting up at all)

The display of this unit lights up dynamically by matrix of P 0 ~ 3 · O 1 ~ 7 and R 8 ~ 14.

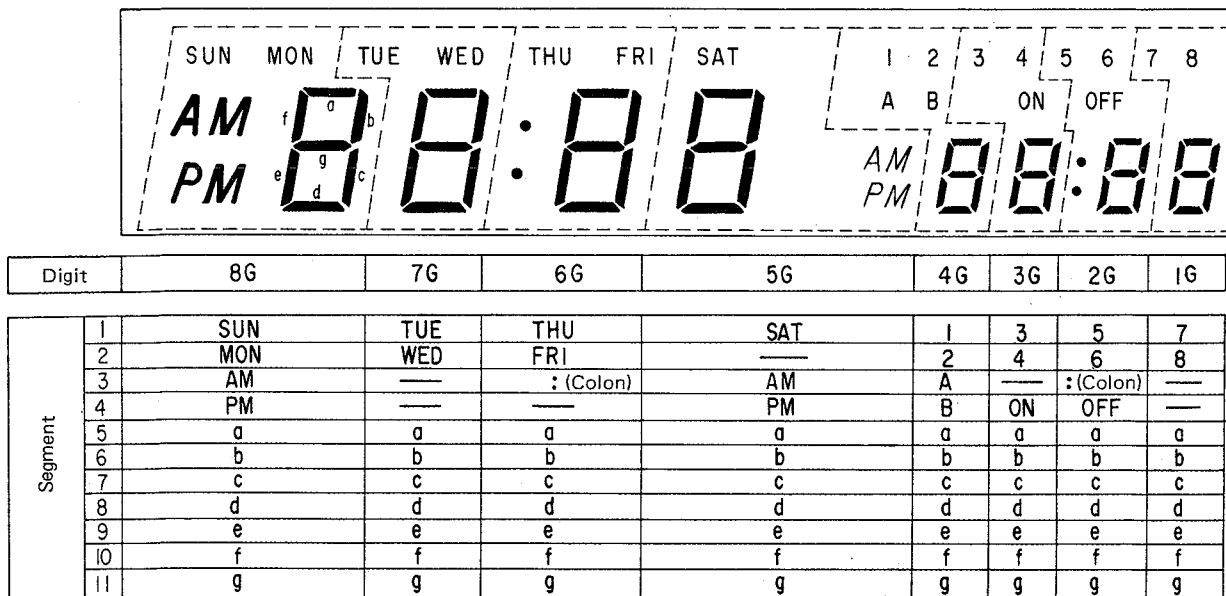
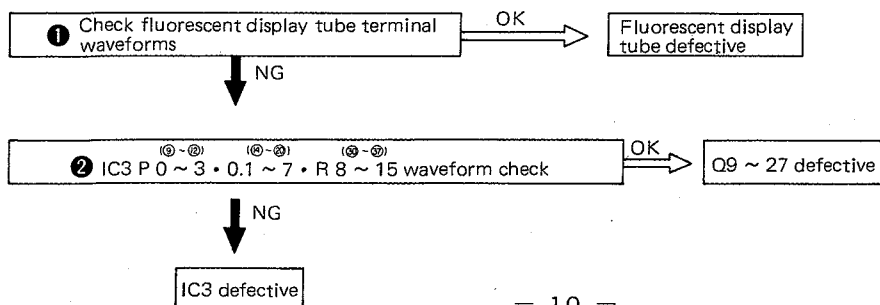
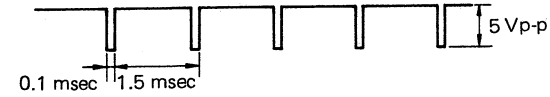
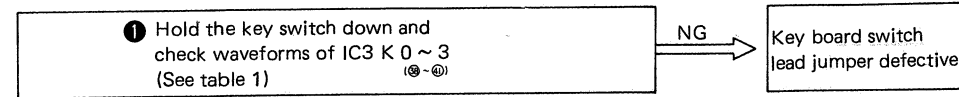


Figure 1



4. Defective response of key switch



OK

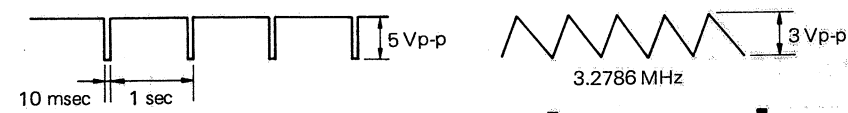
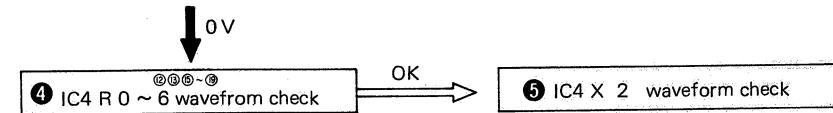
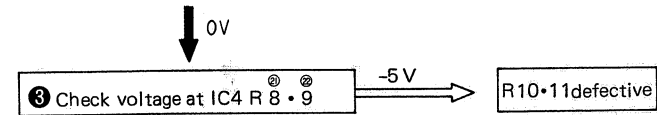
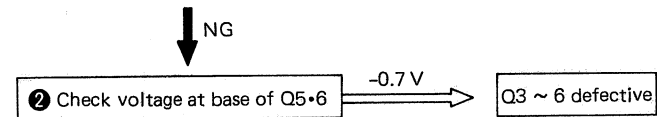
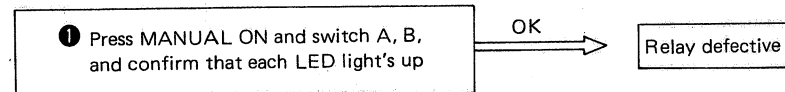
IC3 defective

Note: Make sure that the key switches are not being pressed mechanically.

	③①	③②	③③	③④	③⑤	③⑥		
	R	R8	R9	R10	R11	R12	R13	R14
K								
③⑨	K0	0	4	8	MANUAL ON	SLEEP	SEND	CLOCK
③⑨	K1	1	5	9	MANUAL OFF	TIMER	ZERO SEC	SET
④①	K2	2	6	AM	A	—	CLEAR	—
④①	K3	3	7	PM	B	—	—	—

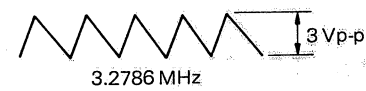
Table 1 Input signal matrix

5. No AC outlet output.



NG

IC3 defective



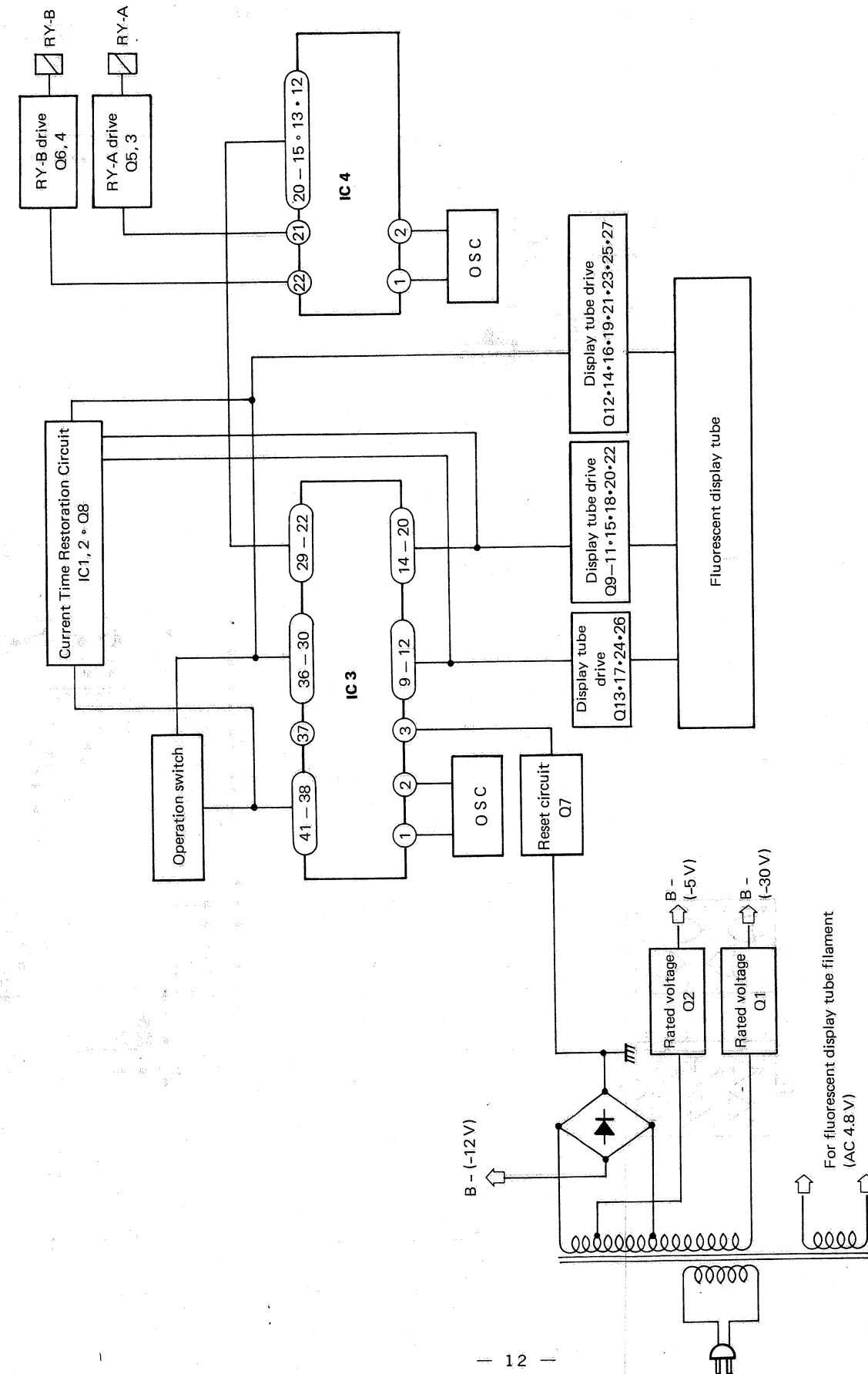
OK

IC4 defective

NG

X2.C7.8.R20 defective

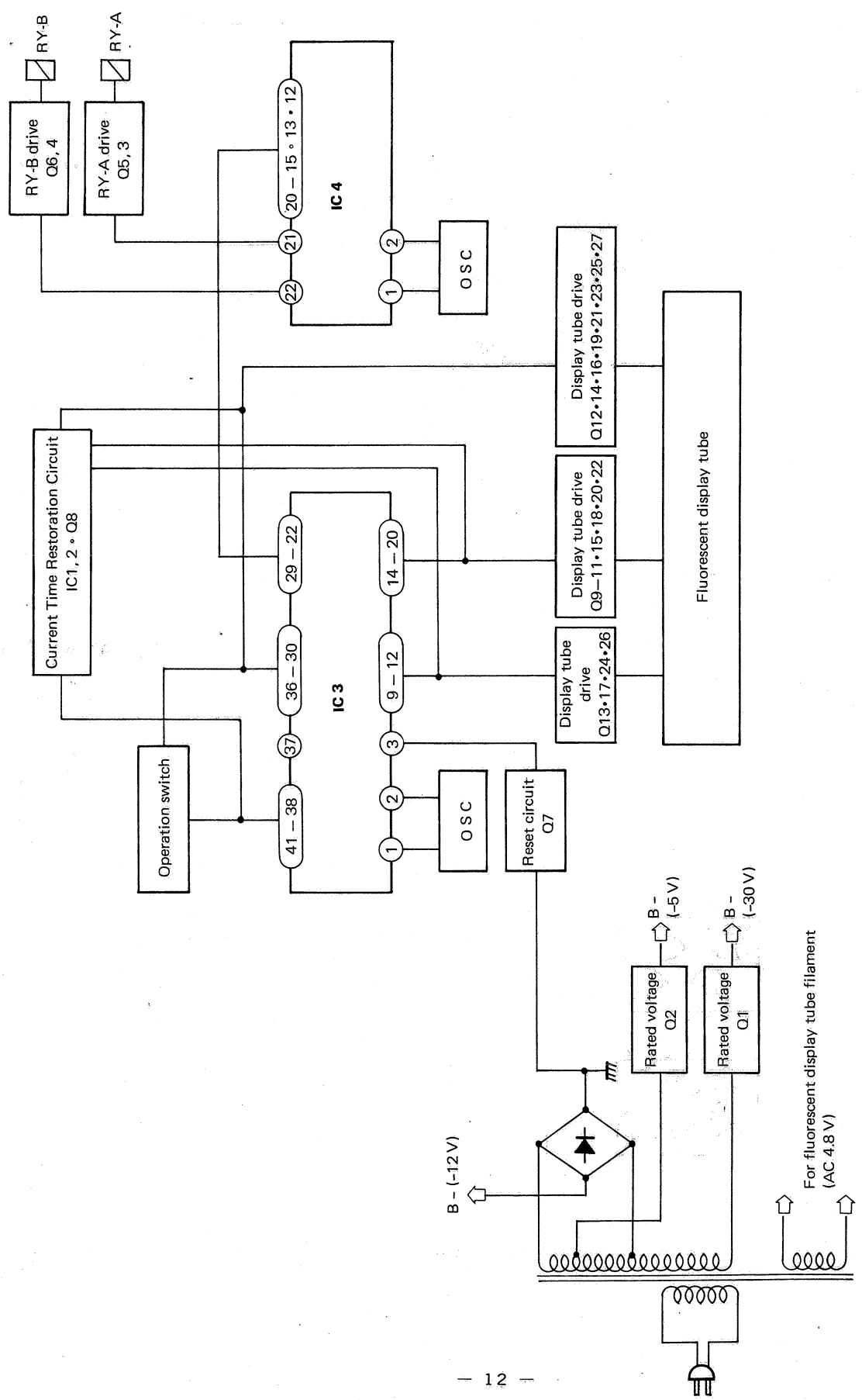
Block Diagram



Disasse
• Disa
• Cabi
R
• Froi
R

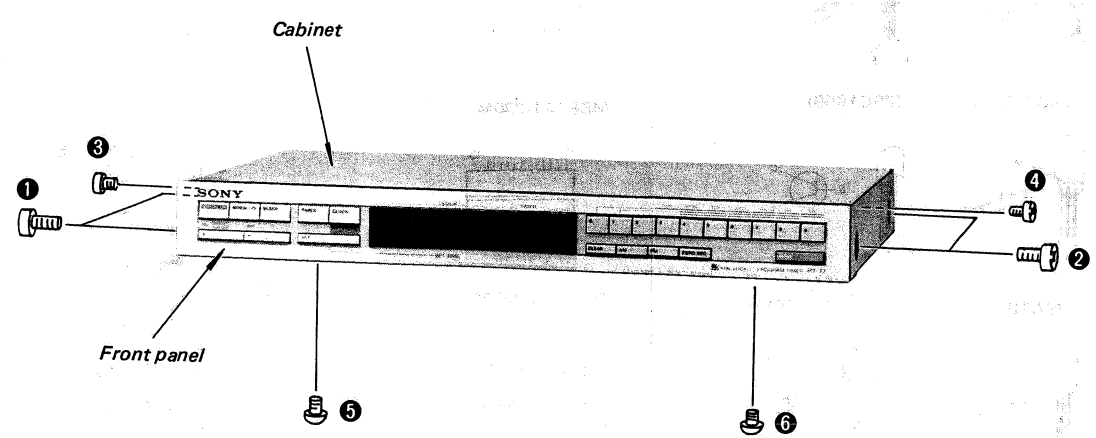
Electric

Block Diagram

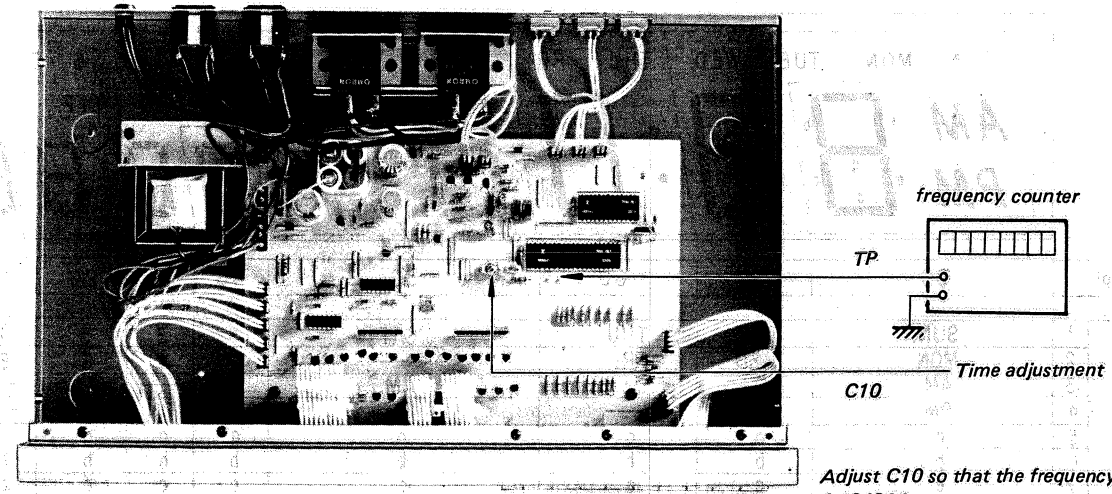


Disassembly

- Disassemble in numerical order.
- Cabinet
 - Remove ① and ②.
- Front panel
 - Remove ③ ~ ⑥.

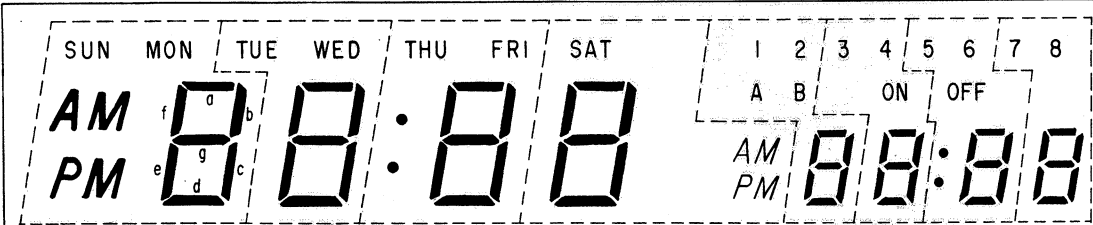
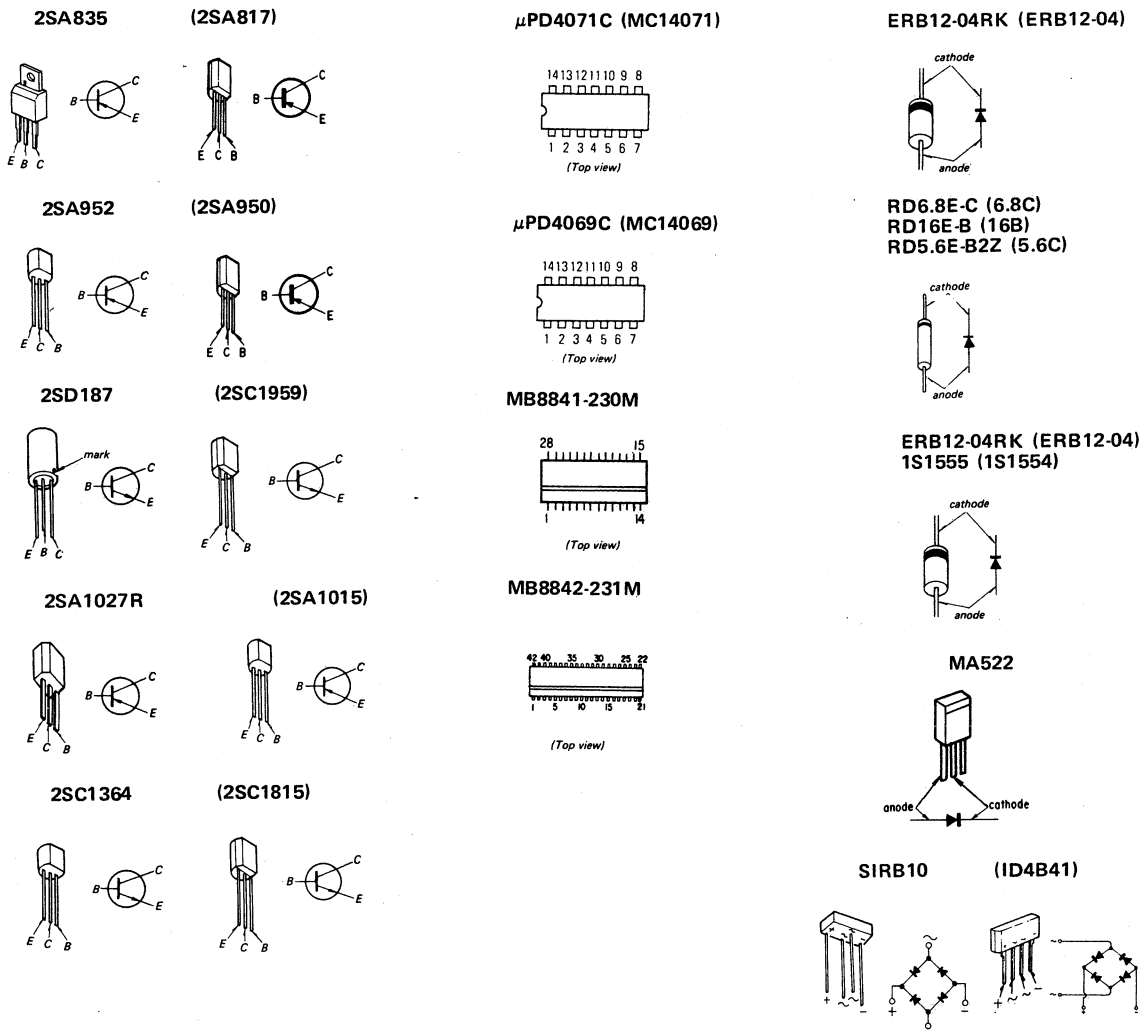


Electrical Adjustment



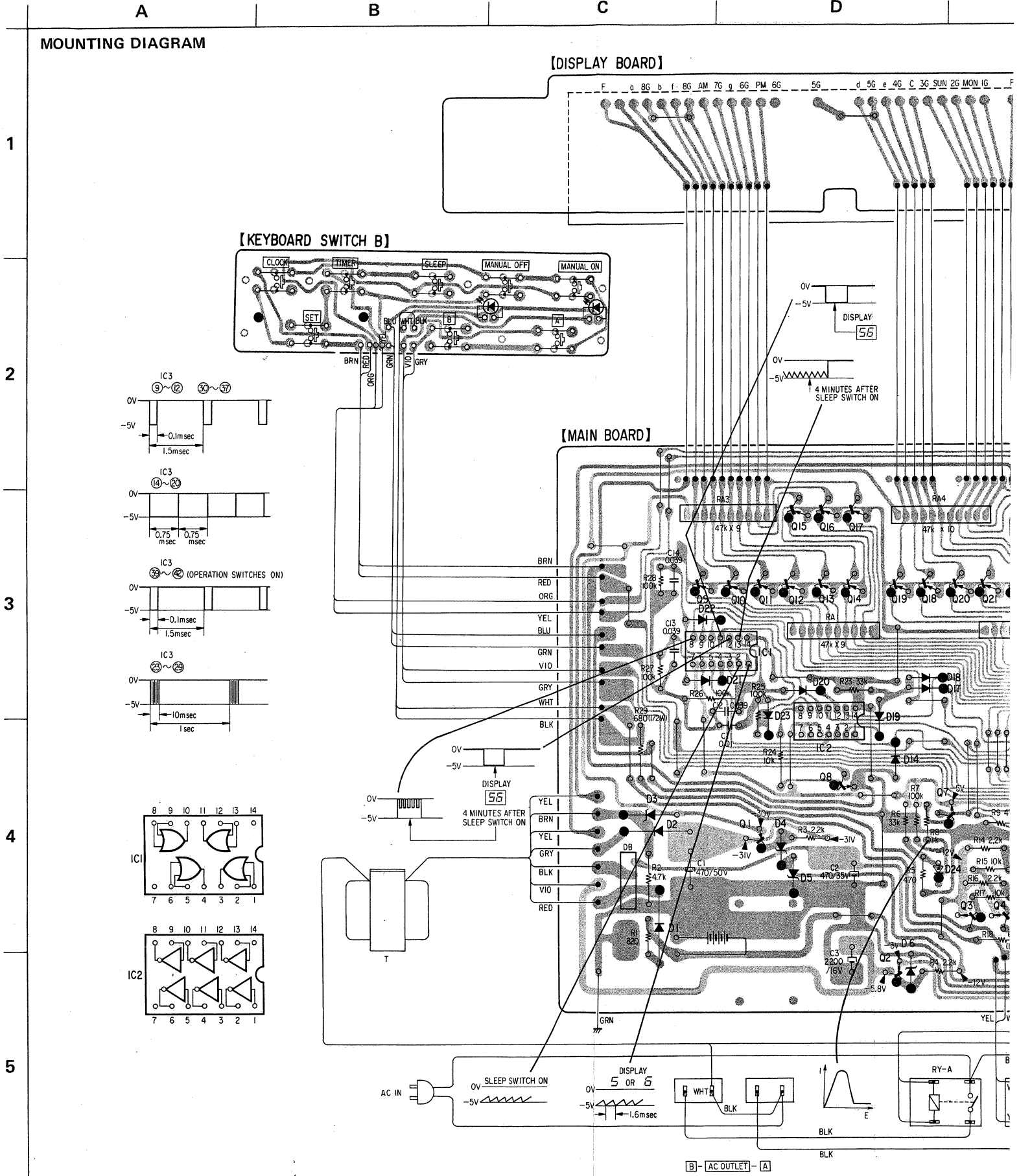
Adjust C10 so that the frequency of TP is 4.194304 MHz (349.525 kHz).

● SEMICONDUCTOR LEAD LAYOUTS

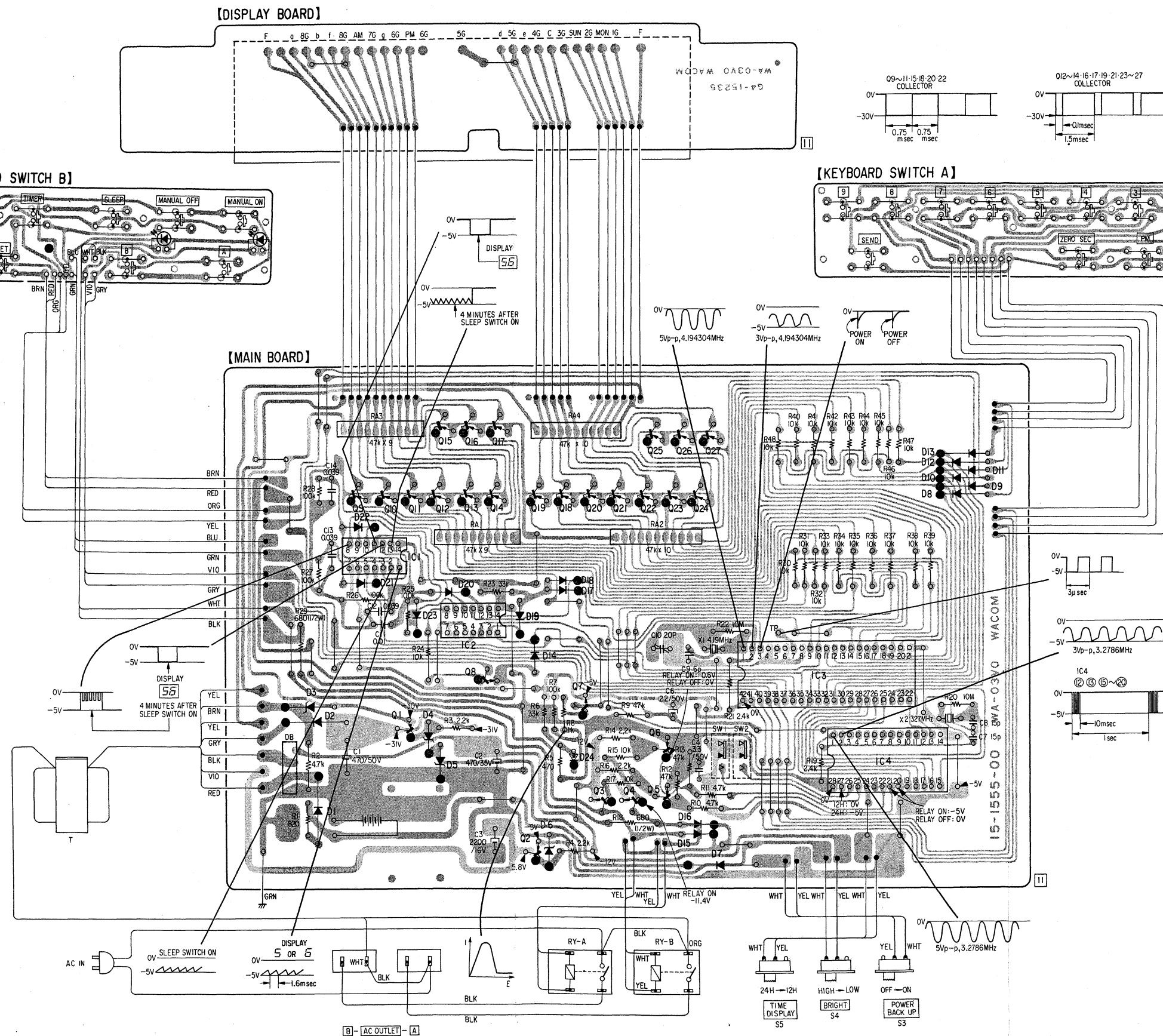
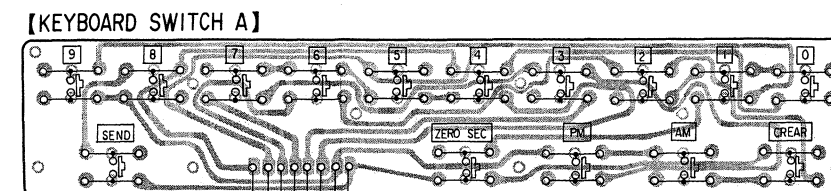
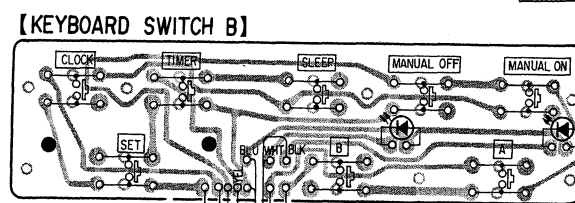
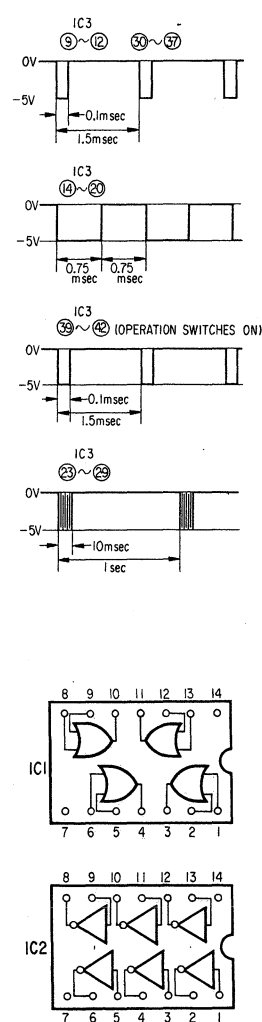


Digit	8G	7G	6G	5G	4G	3G	2G	1G
1	SUN	TUE	THU	SAT	1	3	5	7
2	MON	WED	FRI	AM	2	4	6	8
3	AM	---	:(Colon)	AM	A	---	:(Colon)	---
4	PM	---	---	PM	B	ON	OFF	---
5	a	a	a	a	a	a	a	a
6	b	b	b	b	b	b	b	b
7	c	c	c	c	c	c	c	c
8	d	d	d	d	d	d	d	d
9	e	e	e	e	e	e	e	e
10	f	f	f	f	f	f	f	f
11	g	g	g	g	g	g	g	g

Fluorescent Display Tube



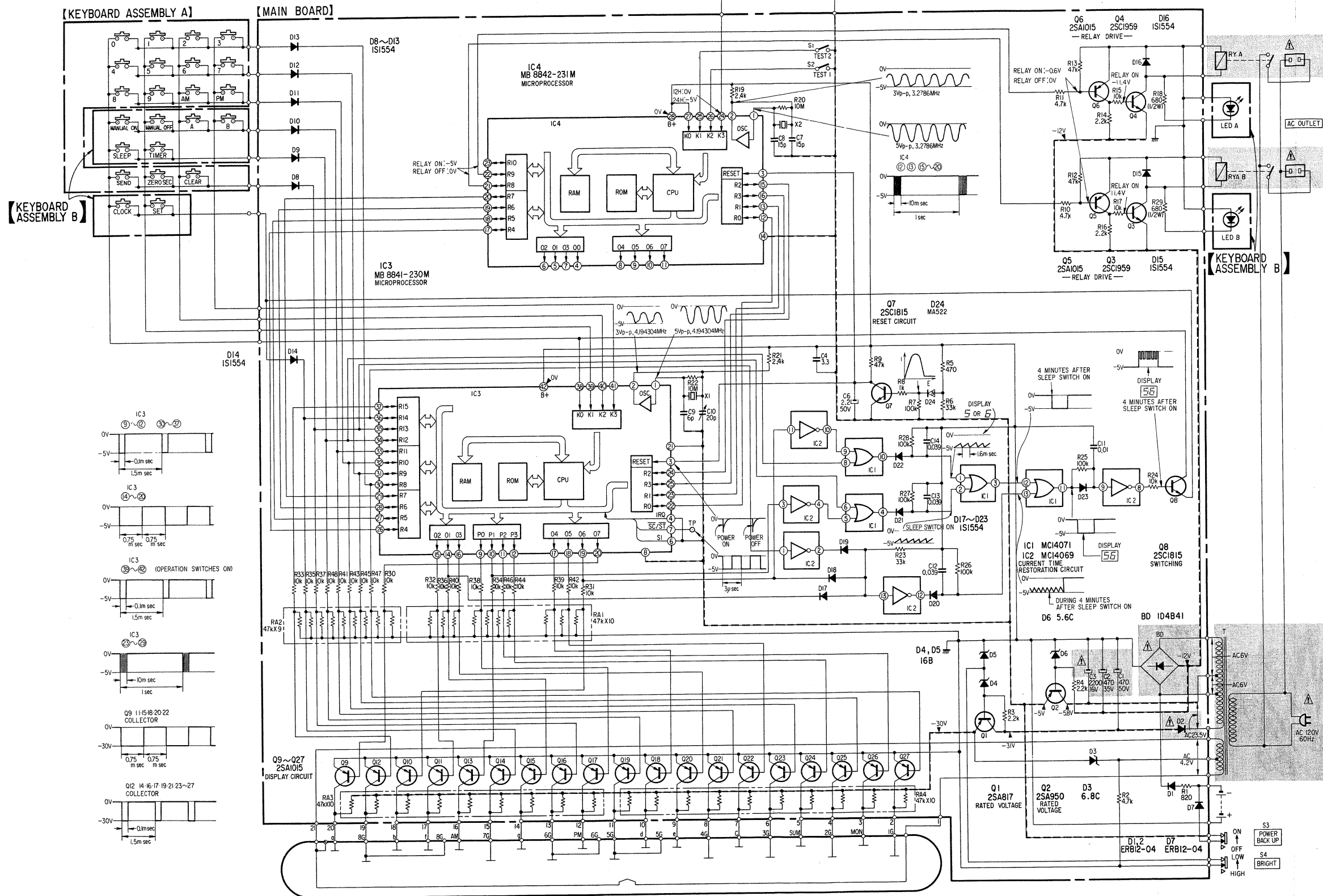
MOUNTING DIAGRAM





Q	D	IC
15 16 17 25 26 27	13 12 11 10 9 8	1
9~14 18~24	21 18 20 17	2
8 7 1 6	3 2 4 5	3
3 4 5 2	16 15 6	4
	7	

Note:
• : B-pattern.


SCHEMATIC DIAGRAM



Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

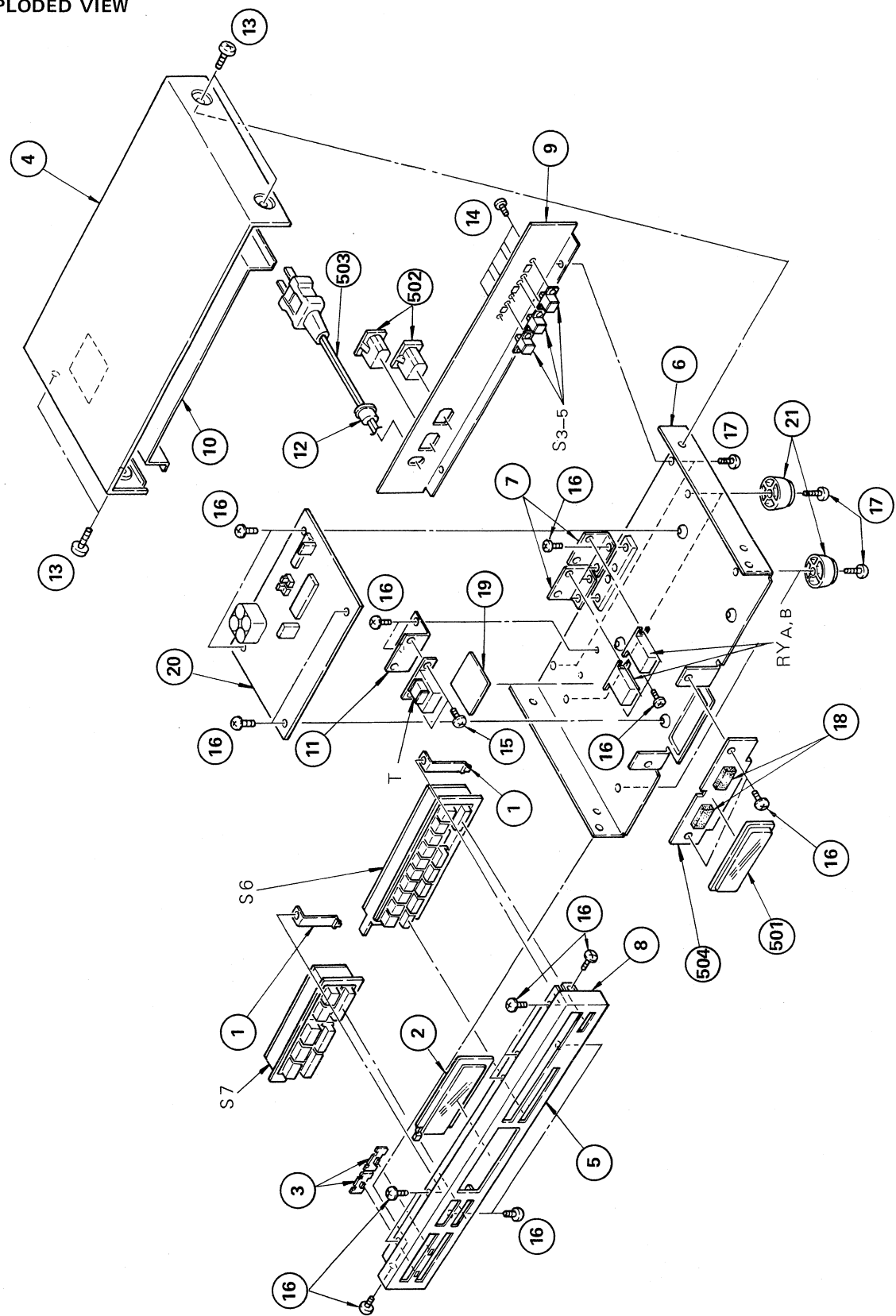
Note:

- All capacitors are in μF unless otherwise noted. pF: μpF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, $\frac{1}{4}$ W unless otherwise noted. k Ω : 1000 Ω , M Ω : 1000 k Ω
-  : panel designation.
- --- : B-bus.

- Readings are taken under no-signal (detuned) conditions.

Note: Voltages are measured with a VOM (50k Ω /V).

EXPLODED VIEW



ELECTRICAL PARTS LIST

GENERAL SECTION

No.	Part No.	Description
1	2-193-906-00	RETAINER
2	2-193-907-00	COVER, INDICATOR
3	2-193-908-00	COVER, LED
4	2-193-915-00	CASE
5	2-193-916-00	PANEL
6	2-193-917-00	CHASSIS
7	2-193-918-00	BRACKET, RELAY
8	2-193-919-00	SUPPORT, PANEL
9	2-193-937-11	PLATE, JACK
10	2-193-938-00	CASE, SHIELD
11	2-193-943-00	BRACKET, TRANSFORMER
12	3-703-244-00	STOPPER, CORD
13	4-847-802-11	SCREW, CASE STOPPER
14	7-621-255-50	SCREW +P 2X8 (S)
15	7-685-760-01	SCREW +PTT 4X6 (S)
16	7-685-871-09	SCREW +BVT 3X6 (S)
17	7-685-873-09	SCREW +BVT 3X10 (S)
18	9-911-845-XX	HOLDER
19	9-911-863-XX	SHEET
20	A-2095-421-A	MOUNTED PCB, CIRCUIT BLOCK
21	X-3556-910-0	FOOT ASSY, MF

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
31	1-528-082-00	BATTERY, NICKEL CADMIUM
32	2-193-933-00	CUSHION
33	2-193-935-00	BAG, POLYETHYLENE
34	2-193-952-00	CARTON
35	3-701-630-00	BAG, POLYETHYLENE
36	3-783-079-01	MANUAL, INSTRUCTION
37	3-783-079-21	MANUAL, INSTRUCTION (US, CND)
38	3-783-079-31	MANUAL, INSTRUCTION (CND)

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF: μF, PF: μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F : nonflammable

COILS

- MMH : mH, UH : μH

ELECTRICAL PARTS

Ref. No.	Part No.	Description
501	1-519-205-00	INDICATOR TUBE, FLUORESCENT
502	▲ 1-526-699-00	AC OUTLET
503	▲ 1-551-510-00	CORD, POWER
504	1-602-887-00	DISPLAY BOARD
C1	▲ 1-123-516-00	470μF 50V
C2	▲ 1-123-507-00	470μF 35V
C3	▲ 1-123-489-00	2200μF 16V
C10	1-141-235-00	20pF
D1	8-719-920-04	DIODE ERB12-04RK
D2	▲ 8-719-920-04	DIODE ERB12-04RK
D3	8-719-168-77	DIODE RD6.8E-C
D4, 5	8-719-116-07	DIODE RD16E-B
D6	8-719-156-25	DIODE RD5.6E-B2Z
D7	8-719-920-04	DIODE ERB12-04RK
D8-23	8-719-815-55	DIODE 1S1555
D24	1-806-014-11	DIODE MA522
D25	▲ 8-719-510-10	DIODE 1SRB10
IC1	8-759-140-71	IC μPD4071C
IC2	8-759-140-69	IC μPD4069C
IC3	1-806-057-11	IC MB8841-230M
IC4	1-806-058-11	IC MB8842-231M
Q1	8-762-020-00	TRANSISTOR 2SA835
Q2	8-729-195-23	TRANSISTOR 2SA952
Q3, 4	8-729-818-70	TRANSISTOR 2SD187
Q5, 6	8-729-612-77	TRANSISTOR 2SA1027R
Q7, 8	8-729-663-47	TRANSISTOR 2SC1364
Q9-27	8-729-612-77	TRANSISTOR 2SA1027R
R1	1-247-236-00	CARBON 680 1/2 W
S3-5	1-552-436-00	SWITCH, SLIDE
S6	X-2193-903-1	SWITCH (A)
S7	X-2193-904-1	SWITCH (B)
T	▲ 1-447-142-00	TRANSFORMER, POWER (CND)
T	▲ 1-477-144-00	TRANSFORMER, POWER (US)
RYA, B	▲ 1-515-431-00	RELAY (US)
	▲ 1-515-432-00	RELAY (CND)
X1	1-527-647-00	OSCILLATOR, CRYSTAL
X2	1-527-648-00	OSCILLATOR, CRYSTAL

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTROLYTIC CAPACITORS

RATING → : Use the high voltage rated one.						
CAP. (μF)	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	25 VOLT. PART No.	35 VOLT. PART No.	50 VOLT. PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	—	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	—
3300	1-121-661-00	1-123-075-00	1-123-071-00	—	—	—

CAP. (μF)	100 VOLT. PART No.	160 VOLT. PART No.	250 VOLT. PART No.	350 VOLT. PART No.
0.47	—	—	—	—
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	—	1-123-028-00
3.3	1-121-995-00	—	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	—	—
47	1-123-251-00	1-121-919-00	—	—
100	1-123-084-00	—	—	—

CERAMIC CAPACITORS

RATING							
CAP. (pF)	50 VOLT. PART No.	CAP. (pF)	50 VOLT. PART No.	CAP. (pF)	50 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

0.001μF = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS

RATING → : Use the high voltage rated one.					
CAP. (μF)	25 VOLT. PART No.	50 VOLT. PART No.	CAP. (μF)	25 VOLT. PART No.	50 VOLT. PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

MYLAR CAPACITORS

RATING											
CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	—	—
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	—	—
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	—	—
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	—	—
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				

TANTALUM CAPACITORS

RATING → : Use the high voltage rated one.							
CAP. (μF)	3.15 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	25 VOLT. PART No.	35 VOLT. PART No.
0.01					→	→	1-131-396-00
0.015					→	→	1-131-397-00
0.022					→	→	1-131-398-00
0.033					→	→	1-131-399-00
0.047					→	→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	—	—	—	—	1-131-412-00	→	1-131-406-00
0.68	—	—	—	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	—	—	1-131-418-00	—	→	1-131-413-00	1-131-408-00
1.5	—	1-131-421-00	—	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	—	1-131-419-00	—	→	1-131-355-00	1-131-349-00
3.3	—	1-131-422-00	—	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	—	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	—	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	—
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00				
68	1-131-394-00	1-131-388-00	—				
100	1-131-395-00	—	—				

TANTALUM CAPACITORS

RATING						
CAP. (μF)	3 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	35 VOLT. PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22						1-131-278-00
0.33					1-131-262-00	1-131-279-00
0.47			1-131-169-00		1-131-263-00	1-131-280-00
0.68			—	1-131-258-00	1-131-264-00	1-131-281-00
1.0			1-131-254-00	—	1-131-265-00	1-131-282-00
1.5		1-131-250-00	—	—	1-131-266-00	1-131-283-00
2.2		—	—	—	1-131-267-00	1-131-284-00
3.3		—	1-131-255-00	1-131-259-00	1-131-268-00	—
4.7		1-131-251-00	1-131-171-00	—	1-131-269-00	—
6.8		—	—	1-131-260-00	1-131-270-00	—
10	—	—	1-131-256-00	—	1-131-271-00	—
15	—	1-131-252-00	—	1-131-261-00	1-131-272-00	—
22	—	—	1-131-257-00	—		
33	1-131-176-00	1-131-253-00	1-131-173-00	—		
47	1-131-288-00	1-131-174-00	—	—		
100	1-131-177-00	—	—	—		

1/4 WATT CARBON RESISTORS

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw:

P 3 x 10

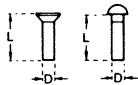
L: Length in mm

D: Diameter in mm

Type of head

Indicated slotted-head only.

Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:

N 3

Diameter of usable screw or shaft

Reference designation



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	